# jean-françois**pambrun**

researcher | engineer | software developer


## about

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## languages

french/english

## programming

java, javascript
matlab, python
linux, git, c, c++
latex, tensorflow

## standards

dicom, ihe, hl7
jpeg 2000, jpip

## interests

medical imaging
image compression
deep learning
rendering

† not a member of the OIQ
‡ fast-track doctoral admission without obtaining a master's degree

## education

2011-2016 **Ph.D. in electrical engineering** — École de technologie supérieure (ÉTS)
*improving medical image compression and transmission*
- *develop a novel image quality metric adapted to diagnostic imaging*
- *propose a novel jpeg 2000 bit allocation mechanism*
- *improve streaming for large image series (ct, mr, tomo, etc.)*
- *skills: research, compression, streaming, matlab, java, c++, itk/vtk*

2009-2010 **M.Sc. in electrical engineering (incomplete‡)** — École de technologie supérieure (ÉTS)
*evaluation of the diagnostic quality of lossy compressed medical images*
- *research medical image quality assessment and diagnostic losslessness*
- *quantify the ct acquisition parameters that affect compressibility*
- *skills: research, compression, matlab, java, c++, itk/vtk, cuda*

2005-2009 **B.ing. in electrical engineering** — École de technologie supérieure (ÉTS)
information technologies and telecommunication

## experience

2016 (dec-) **software developer** — nucleus.io
*cloud-based diagnostic workstation with client-side MPR*
- *design and implement a client-side multi-planar reconstruction renderer*
- *design and implement a 3d compression algorithm for fast streaming*
- *design and implement annotation tools such as length, Cobb angle, etc*
- *write highly optimized code using the latest web technologie*
- *ensure support for ct, mr, pet, ultrasound, large tomosynthesis, etc*
- *skills: javascript, nosql, mongodb, python, nodejs, webgl, rendering*

2016 (jun-dec) **postdoctoral fellow** — CHUM research centre
*improve image-guided prostate cancer brachytherapy treatments*
- *implement MR-Ultrasound fusion and segmentation using machine learning*
- *study the impact of dual energy ct dect) on current fusion algorithms*
- *evaluate an experimental non-rigid mr-us fusion workflow in the operating room*
- *skills: python, tensorflow, machine learning, registration, segmentation*

2016 (sep-dec) **lecturer** — École polytechnique de montréal
*procedural programming (inf1005a)*
- *teach introductory procedural programming using matlab*
- *skills: communication, leadership*

# experience (cont.)

2009-2016 **lecturer** École de technologie supérieure (ÉTS)
*software development environment (ele116)*
· *teach object oriented programming with java*
· *discuss development tools such as ide, debuggers and git*
*image processing and analysis (ele747)*
· *teach image processing techniques using matlab*
· *discuss topics such as fft, edge detectors and compression*

2007-2014 **teaching assistants** École de technologie supérieure (ÉTS)
healthcare distributed systems (gts840)
· supervise and grade graduate student lab assignments
· discuss topics such as hl7, ihe and dicom
software development environment (ele116)
image processing and analysis (ele747)

2009 (jan-sep) **software developer** CAE inc.
*head-up display simulation for military flight simulators*
· *implement a c/c++ modules to stimulate and simulate avionic systems*
· *implement an opengl solution to simulate a hud*
· *work with clients to fix issues and achieve acceptance*
· *skills: c, c++, pascal, opengl, simulation*

2006-2008 **research assistant** École de technologie supérieure (ÉTS)
*implementation of a standard compliance validation tool for hl7v3*
· *implement a hl7v3 for validation prior to connectathon*
· *provide support for implementors*
· *skills: java, xml, xml schemas, xslt, soap, dicom, ihe, hl7*
*implementation and evaluation of a medical image streaming framework*
· *evaluate jpip for large image stacks and large image streaming*
· *skills: java, jpip, jpeg 2000*

# awards

| | | |
|---|---|---|
| 2017 | **NSERC postdoctoral fellowship (declined)** | 90,000$ |
| 2017 | **FRQNT postdoctoral fellowship (declined)** | 70,000$ |
| 2016 | **GRSTB postdoctoral fellowship** | 18,000$ |
| 2011 | **NSERC doctoral Alexander-Graham-Bell scholarship** | 105,000$ |
| 2011 | **ÉTS excellence graduate student scholarship** | 60,000$ |
| 2011 | **FRQNT doctoral research scholarship (declined)** | 60,000$ |
| 2009 | **FRQNT master's research scholarship** | 30,000$ |
| 2006 | **NSERC undergraduate student research award** | 4,500$ |

# committee and board memberships

2013-2016 **board member of an NPO** Association étudiante de l'ÉTS
*vice-president of services*
*academic commission student representative*
*disciplinary committee student representative*

# publications

## articles in peer-reviewed journals

The utilization of MRI in the operating room
Ménard C , Pambrun J-F, Kadoury S
Brachytherapy. *Elsevier, 2017*

Computed Tomography Image Compressibility and Limitations of Compression Ratio-Based Guidelines
Pambrun J.F. , Noumeir R.
Journal of Digital Imaging. *Springer Science, 2015*

Teaching DICOM by Problem Solving.
Noumeir R. , Pambrun J.F.
Journal of Digital Imaging. *Springer Science, 2012*

Streaming of medical images using JPEG2000 interactive protocol
Pambrun J.F. , Noumeir R.
International Journal of Innovative Computing and Applications. *2012*

Using JPEG 2000 Interactive Protocol to Stream a Large Image or a Large Image Set
Noumeir R. , Pambrun J.F.
Journal of Digital Imaging. *Springer Science, 2010*

## international peer-reviewed conferences/proceedings

Limitations of the SSIM quality metric in the context of diagnostic imaging
Pambrun J.F. , Noumeir R.
*IEEE International Conference on Image Processing (ICIP)*, 2015

Compressibility variations of JPEG2000 compressed computed tomography
Pambrun J.F. , Noumeir R.
*IEEE International Conference of the Engineering in Medicine and Biology Society (EMBC)*, 2013

Learning DICOM by solving real clinical problems
Noumeir R. , Pambrun J.F.
*IEEE-EMBS International Conference on Biomedical and Health Informatics*, 2012

Perceptual quantitative quality assessment of JPEG2000 compressed ct images with various slice thicknesses
Pambrun J.F. , Noumeir R.
*IEEE International Conference on Multimedia and Expo*, 2011

Interoperability testing of integration profiles based on HL7 standard version 3
Pambrun J.F. , Noumeir R.
*IEEE International Conference on Information Technology and Applications in Biomedicine*, 2010

Hands-on Approach for Teaching HL7 version 3
Noumeir R. , Pambrun J.F.
*IEEE International Conference on Information Technology and Applications in Biomedicine*, 2010

Streaming of Medical Images Using JPEG 2000 Interactive Protocol
Noumeir R. , Pambrun J.F.
*IEEE International Conference on Systems, Signals and Image Processing.* 2010

Interoperability Testing Software for Sharing Medical Documents and Images
Berube R. , Pambrun J.F, Noumeir R.
*IEEE International Conference on Internet and Web Applications and Services.* 2010

Images within the Electronic Health Record
Noumeir R. , Pambrun J.F.
*IEEE International Conference on Image Processing.* 2009